

STUDIES IN THE TREATMENT OF MALARIA

XIV. QUININE BIHYDROCHLORIDE GRAINS 30 INTRAMUSCULARLY, AND QUININE HYDROCHLORIDE GRAINS 30 ORALLY, DAILY, FOR 12 DAYS, IN SIMPLE TERTIAN MALARIA

BY

LIEUT.-COL. J. W. W. STEPHENS, R.A.M.C.

W. YORKE

B. BLACKLOCK

J. W. S. MACFIE

C. FORSTER COOPER

AND

H. F. CARTER

*(From the Liverpool School of Tropical Medicine)**Undertaken at the request of the War Office**(Received for publication 29 June, 1918)*

This treatment (Aldershot, C 17) is recorded by Sir Ronald Ross in an 'Interim Report on the Treatment of Malaria,' issued by the War Office, 24/Gen. No. (A.M.D. 2) 6,198, presented 24th November, 1917, with Postscript, dated 4th March, 1918. The full description of the treatment is as follows:—

'Quinine bihydrochloride by intramuscular injection 15 grains simultaneously in each deltoid with 10 grains, orally, of hydrochloride thrice daily, totalling 60 grains daily, for 12 days. Patient remaining in bed for 12 days.

Given to 49 cases from 10th July, 1917, to 22nd October, 1917. Of these 5 relapsed (10 per cent.) up to the 31st December, 1917. Relapses occurred in an average of 34 days (extremes 16 to 72 days). Treatment quickly effective and well borne. Medical Officer thinks that the 12 days' rest in bed is of great value and would advocate 3 weeks of such rest. He thinks that this is the best form of treatment yet used by him. See remarks below.

Remarks.—On the 16th and 17th November, 1917, I inspected 79 of the men who had been through the Aldershot courses C 15, 16 and 17, and found that unfortunately many of them had been given daily doses of quinine (generally only 5 grains) by the Medical Officers of their units after they

had been discharged from the special malaria wards. The low proportion of relapses in these 3 treatments (8 to 20 per cent.) may be partly due to this continued medication; but as none of the 79 men had returned to hospital and only 6 of them looked at all unwell, I gathered that this continued medication had been unnecessary, and that most of the men had been really cured. Further study of these cases is in progress. See *Postscript*.'

In the postscript dated 4th March, 1918, it is added:—

'quinine was prohibited for all the 79 men examined by me in November, 1917, and every man was ordered to attend hospital weekly for clinical inspection, blood examination, and record of weight. Only 2 of these men have relapsed since then. On the 25th to 27th February, 1918, after my return from Salonika, I examined again 66 out of the 79 men, and concluded that they were all now probably free from infection. The figures for Treatments C 15 and 17 have been amended accordingly. With our present information, therefore, Treatment C 17 seems to be the best for resolving infections.'

Thirty cases were subjected to the treatment.* A summary of the results of treatment is given in the Table, which also contains the following additional information:—Place of infection; and interval in months between present treatment and date of (*a*) first admission to a hospital for malaria, (*b*) leaving infected area, (*c*) arrival in England.

Blood examinations were made daily in all the cases.

Parasites disappeared from the blood, as a rule, in one to two days, in two cases in three days, and in two cases in four days. The temperature, as a rule, fell to normal either on the day of, or one day after, the commencement of treatment.

Relapses. In twenty-six of thirty cases a parasitic relapse occurred in eight to fifty-six days, average eighteen days. In four cases there was no parasitic relapse within an observation period of sixty-seven to a hundred days.

CONCLUSION

The Aldershot C 17 Treatment, as described in an 'Interim Report on the Treatment of Malaria' issued by the War Office, may be followed by 87 per cent. of relapses within a post-treatment observation period of sixty days.

* The treatment administered was that described as C 17 in the Official Interim Report on the Treatment of Malaria 24 Gen No. (A.M.D.2) 6198 and circulated by the War Office at the beginning of April. This report was also read as a paper on Feb. 15th at the Society of Tropical Medicine and Hygiene. We find in *Trans. Soc. Trop. Med. & Hyg.* (issued June 1918) that at the adjourned discussion on this paper (March 15th) the treatment instead of lasting 12 days, is given as lasting 29 days. Our treatment is that described as C 17 in the Official Report.

TABLE
Summary of results of Treatment C 17.
(Quinine bishydrochloride grains 30 intramuscularly and quinine hydrochloride grains 30 orally, daily for 12 days).

* E.A. = East Africa. S. = Salonika.

Number of case	Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of commencement of treatment	Temperature fell to normal in — days after first dose	Parasites disappeared from cutaneous blood in — days after first dose	Parasitic relapse occurred in — days after last dose	Febrile relapse (above 100° F.) occurred in — days after last dose	Observation period in days in cases in which did not relapse	Remarks
820	E.A.	10	3	2	4-5-18	Same day	2	12	16	...	
821	S.	8	5	3	24-4-18	1	2	13	16	...	
822	S.	6	2	1	7-5-18	1	2	13	16	...	
823	S.	18	2	1	25-4-18	1	1	16	14	...	
824	S.	9	2	1	25-4-18	Same day	1	...	...	67	
825	S.	23	2	1	24-4-18	1	2	10	14	...	100-2° on 1st day after end of treatment
826	S.	18	3	2	9-5-18	Same day	2	9	23	...	
827	S.	22	3	2	25-4-18	Same day	1	16	15	...	
828	S.	8	6	5	24-4-18	1	2	56	58	...	101° on last day of treatment; 100° on 1st day after, 102-2° on 2nd day after end of treatment Quinine orally on 55th day
829	S.	10	2	2	9-5-18	1	2	53	...	...
830	S.	15	2	1	14-5-18	Same day	1	13	16	...	
831	S.	20	4	3	9-5-18	1	2	12	16	...	
832	E.A.	13	2	1	25-4-18	1	1	21	21	...	
833	E.A.	13	3	1	26-4-18	1	2	19	22	...	
834	S.	14	4	3	9-5-18	1	2	11	14	...	100° on 4th day after end of treatment
835	E.A.	14	5	4	25-4-18	Same day	1	33	...	...	Parasites also found on 36th and 38th days. No febrile relapse in 57 days
836	E.A.	11	9	6	14-5-18	Same day	2	17	20	...	

Summary of results of Treatment C 17.

(Quinine bihydrochloride grains 30 intramuscularly and quinine hydrochloride grains 30 orally, daily for 12 days).

* E.A. = East Africa. S. = Salonika.

Number of case	*Place of infection	Interval (in months) between first admission to a hospital with malaria and present treatment	Interval (in months) between leaving infected area and present treatment	Interval (in months) between arrival in England and present treatment	Date of commencement of treatment	Temperature fell to normal in — days after first dose	Parasites disappeared from cutaneous blood in — days after first dose	Parasitic relapse occurred in — days after last dose	Febrile relapse (above 100° F.) occurred in — days after last dose	Observation period in days in cases which did not relapse	Remarks
837	S.	9	2	1	26.4.18	1	4	...	...	100	101° on 3rd day before end of treatment; 100° on 31st day after end of treatment
838	S.	14	4	3	7.5.18	1	2	15	17	...	Quinine orally on 13th day
839	E.A.	6	5	1	24.4.18	1	2	12	...	...	100° on 12th and 13th days after end of treatment
840	E.A.	9	6	5	25.4.18	1	2	19	18	...	101° and 100° on 6th and 14th days after commencement of treatment
841	S.	9	2	1	25.4.18	1	1	24	93	...	101° on 8th day; 102° on 9th day after commencement of treatment
842	S.	1	4	3	24.4.18	1	3	...	...	73	100° on 1st, 11th, 16th, 17th and 25th days after end of treatment
843	E.A.	6	4	2	7.5.18	1	2	21	25	...	102.2° on 3rd day; 102.4° on 14th day after commencement of treatment
844	S.	17	2	1	9.5.18	3	3	...	...	67	
845	S.	8	2	1	26.4.18	1	4	33	33	...	
846	E.A.	7	2	1	24.4.18	Same day	2	30	29	...	
847	S.	13	2	1	26.4.18	2	2	8	13	...	
848	E.A.	24	4	1	25.4.18	Same day	1	18	18	...	
849	S.	8	2	2	25.4.18	Same day	1	10	10	...	